IN THE CLAIMS:

Please amend claims in accordance with the listing of claims shown below. The listing of claims will replace all prior versions, and listings of claims in the Application:

1.   (Currently Amended)   A system comprising:

an array of unit cells disposed on a chip adapted to receive a conductive solution including charged biological materials, the cells being arranged in rows and columns, each unit cell including an electrode,

a row selector external to the array and operatively connected to the array for selective addressing of rows of the array,

a column selector external to the array and operatively connected to the array for providing an indication of output values and for selective addressing of the columns of the array,

an input adapted to receive unit cell selection information, the input coupled to the row selector and the column selector,

current circuitry for receiving an input current and providing electrical current to the electrodes of the unit cells ,

power source connectors adapted to receive power, the connectors supplying power to the unit cells, and

a current mirror system for receipt of current at a first value and outputting current at a second value.

2.   (Previously Amended)   The system of claim 1 wherein the row selector includes a memory.

3.   (Previously Amended)   The system of claim 2 wherein the memory is a shift register memory.

4.   (Previously Amended)   The system of claim 3 wherein the shift register is in a by one configuration.

5.   (Previously Amended)   The system of claim 1 wherein the row selector includes a decoder.

6.   (Previously Amended)   The system of claim 1 wherein the column selector includes a memory.

7.   (Previously Amended)   The system of claim 6 wherein the memory is a shift register memory.

8.   (Previously Amended)   The system of claim 7 wherein the shift register memory is in a by one configuration.

9.   (Previously Amended)   The system of claim 7 wherein the shift register memory is in a by four configuration.

10.   (Previously Amended)   The system of claim 1 wherein the column selector includes a decoder.

11.   (Previously Amended)   The system of claim 1 further including a variable current waveform generator.

12.   (Cancelled)

13.   (Currently Amended)   The system of claim 1 wherein the second value is smaller than the first value.

14.   (Previously Amended)   The system of claim 13 wherein the second value is at least twenty times less than the first value.

15.   (Previously Amended)   The system of claim 1 further including multiplexers for the alternative input of row and column selection.

16.   (Previously Amended)   The system of claim 1 wherein the input current comprises a current waveform.

17.   (Previously Amended)   The system of claim 16 wherein the current waveform is a static, direct current waveform.

18.   (Previously Amended)   The system of claim 16 wherein the current waveform is a square wave.

19.   (Previously Amended)   The system of claim 18 wherein the current waveform is an asymmetric square wave.

20. (Previously Amended)   The system of claim 16 wherein the current waveform is a sinusoidal wave.

21. (Previously Amended)   The system of claim 16 wherein the current waveform is a sawtooth wave.

22. (Previously Amended)   A system comprising:

an array of unit cells disposed on a chip adapted to receive a conductive solution including charged biological materials, each unit cell including a row contact and a column contact, row lines, the row lines being coupled to the row contacts of the array,

a row selector, the row selector being coupled the row lines to provide a row select voltage.

column lines, the column lines being coupled to the column contacts of the array,

a column selector, the column selector being coupled to the column lines to provide more than two column voltage states on the column lines,

the unit cells being coupled to a supply and to an electrode, the row select voltage and the column voltage states providing a variable current output from the electrode of the unit cell, and

a return electrode coupled to a potential and adapted to contact the conductive solution,

whereby in the presence of the conductive solution, current is provided between various unit cells, including the return electrode.

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23.   (Original)   The system of claim 22 wherein the return electrode is a unit cell of the array.

24.   (Original)   The system of claim 22 wherein the row selector includes memory.

25.   (Original)   The system of claim 24 wherein the memory includes a shift register memory.

26.   (Original)   The system of claim 24 wherein the shift register memory is in a by one configuration.

27.   (Original)   The system of claim 22 wherein the row selector includes a decoder.

28.   (Original)   The system of claim 22 wherein the column selector includes memory.

29.   (Original)   The system of claim 28 wherein the memory includes shift register memory.

30.   (Original)   The system of claim 29 wherein the shift register memory includes multiple bits per column of unit cells.

31.   (Original)   The system of claim 30 wherein there are at least four bits per column of unit cells.

32. (Original) The system of claim 22 wherein each unit cell further includes a second row contact and a second row line coupled to the second row contact.

33. (Original) The system of claim 22 further including a second row selector.

34. (Original) The system of claim 22 wherein each unit cell further includes a second column contact and second column line coupled to the second column contact.

35. (Original) The system of claim 22 further including a second column selector.

Claims 36-73   (Cancelled)